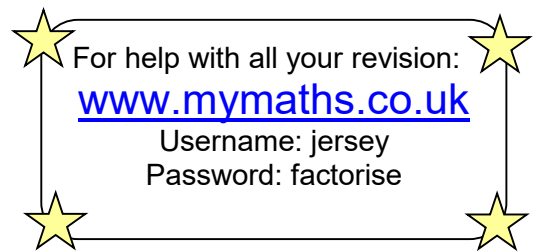


# D1 NA Revision Worksheet



## Number

- Can you write powers of 10 as indices?



Write these numbers as powers of 10:

(a) 1000000

(d) One billion

(b) 10000

(e) One hundred

(c) 10

(f) One million million

- Can you carry out multiplication and division of indices?
- Can you raise numbers to the power of zero?



### Rules of Indices:

1. The multiplication rule:  $y^a \times y^b = y^{a+b}$  (e.g.  $8^2 \times 8^3 = 8^{2+3} = 8^5$ )
2. The division rule:  $y^a \div y^b = y^{a-b}$  (e.g.  $12^9 \div 12^3 = 12^{9-3} = 12^6$ )
3. The brackets rule:  $(y^a)^b = y^{ab}$  (e.g.  $(7^4)^2 = 7^{4 \times 2} = 7^8$ )
4. The power of zero:  $y^0 = 1$
5. The power of one:  $y^1 = y$

Simplify, leaving your answers as powers of 10:

(a)  $10^5 \times 10^3$

(c)  $(10^7)^3$

(e)  $1000 \div 1000$

(b)  $10^{13} \div 10^4$

(d)  $(10^6)^4 \div 10^{18}$

(f)  $4 \times 5^2$

Evaluate:

(a)  $10^3 \times 10^2$

(c)  $(2^2)^2$

(e)  $8^5 \div 8^4$

(b)  $10^{12} \div 10^9$

(d)  $27^0$

(f)  $10^2 \times 3^2$

- Can you calculate squares, cubes and square roots?



Use a multiplication method to evaluate: (a)  $4.5^2$  (b)  $1.9^2$

Evaluate: (a)  $7^2$  (b)  $9^2$  (c)  $\sqrt{121}$  (d)  $4^3$

Memorise the first 15 square numbers and the first 5 cube numbers, and  $10^3$

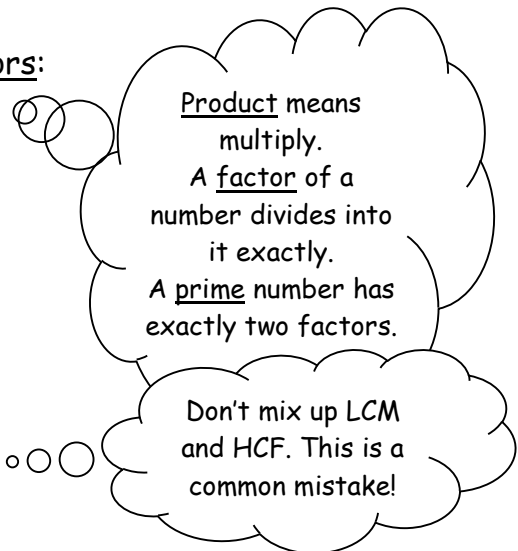
- Can you use estimate roots of numbers given knowledge of perfect squares?

Estimate: (a)  $\sqrt{20}$  (b)  $\sqrt{80}$  (c)  $\sqrt{130}$  (d)  $\sqrt{5}$

- Can you write numbers as products of their prime factors, then use this to find the HCF and LCM of two numbers? 😊 😐 😞

Write the following numbers as products of their prime factors:

- (a) 12 (c) 45 (e) 50  
 (b) 18 (d) 60 (f) 72



Use these answers to help you calculate the highest common factor (HCF) of 45 and 72.

Use these answers to help you calculate the lowest common multiple (LCM) of 18 and 60.

- Given the answer to a calculation, can you find the answer for related calculations? 😊 😐 😞

Without using a calculator, work out the exact answer to these sums:

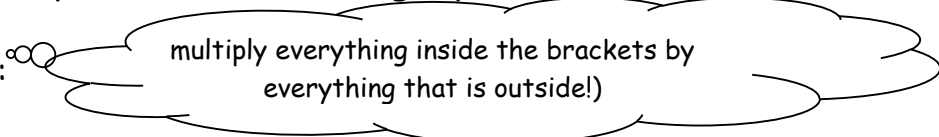
- (a)  $4000 \times 0.07$  (c)  $36 \div 0.04$   
 (b)  $1.3 \times 0.005$  (d)  $4.5 \div 0.15$

If  $36 \times 51 = 1836$ , what is the value of...?

- (a)  $3.6 \times 0.51$  (c)  $1836 \div 3.6$   
 (b)  $360 \times 5.1$  (d)  $3672 \div 510$

## Algebra

- Can you expand expressions with a single pair of brackets? 😊 😐 😞

Expand the brackets:  multiply everything inside the brackets by everything that is outside!

(a)  $7(5a + 6)$

(b)  $-3g(g - 2)$

(c)  $4c(7c + 10c^2 - 1)$

Expand the brackets then simplify expressions:

(a)  $5(2x + 1) + 3(x - 4)$

(c)  $4(2x + 10) - (30 - 5x)$

(b)  $3(x + 5) - (x - 9)$

(d)  $8(5y + 12) + 3(4y - 10)$

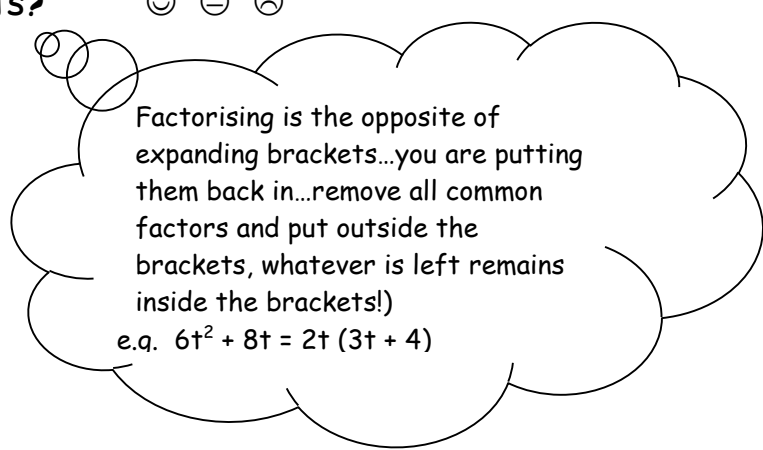
- Can you factorise into single brackets? 😊 😐 😞

Fully factorise:

(a)  $40x + 16$

(b)  $9xy - 81y^3$

(c)  $4e^2f + 6ef - 2ef^2$

 Factorising is the opposite of expanding brackets...you are putting them back in...remove all common factors and put outside the brackets, whatever is left remains inside the brackets!

e.g.  $6t^2 + 8t = 2t(3t + 4)$

- Can you expand these products of two brackets?

$(x + 4)(x + 7)$


$(x - 10)(x + 10)$

$(x - 2)(x + 3)$

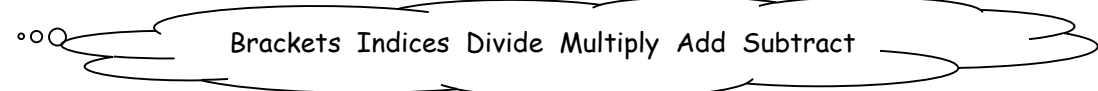
$(x - 5)(2x - 3)$

$(x + 6)^2$

$(4x - 6)(5x + 2)$

 Watch the negatives!

- Can you substitute into expressions, adhering to BIDMAS? 😊 😐 😞

 Brackets Indices Divide Multiply Add Subtract

Use the formula  $v = \sqrt{u^2 + 2as}$  to find v:

(a) when  $u = 4$ ,  $a = 2$  and  $s = 5$

(b) when  $u = 10$ ,  $a = 9$  and  $s = -2$

If  $k = 7$ , calculate:

(a)  $2k$

(b)  $k^2$

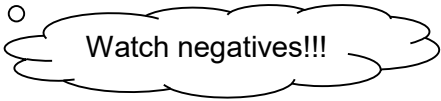
(c)  $2k^2$

(d)  $2(k^2)$

- Can you simplify expressions by writing terms in index notation? 😊 😐 😞

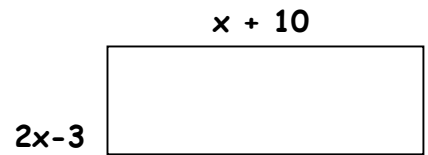
Using the rules for calculating with indices (see number work), express as simply as possible:

- (a)  $d^9 \times d^{11}$       (b)  $5^{-4} \times 5^6$       (c)  $g^4 \div g^3$       (d)  $f^5 \div f^{-4}$   
 (e)  $(r^3)^4$       (f)  $(h^{-5})^{-2}$



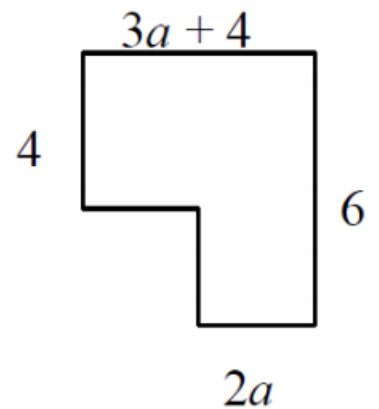
- Can you form expressions from physical situations? 😊 😐 😞

Write down an expression for the area and perimeter of this rectangle.



Perimeter: .....

Area: .....



Perimeter: .....

Area: .....

# D1 GD Revision Worksheet

## Geometry

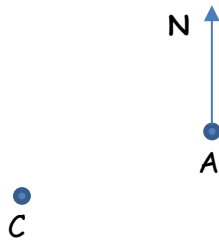
For help with all your revision:

[www.mymaths.co.uk](http://www.mymaths.co.uk)

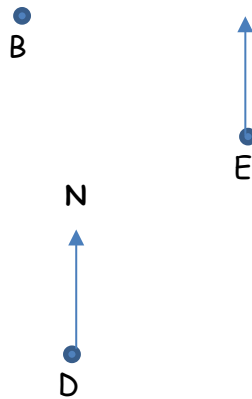
Username: jersey  
Password: factorise

- Can you measure, draw, and calculate bearings? 😊 😐 😞

Measure the bearing of B from A  
Measure the bearing of C from A



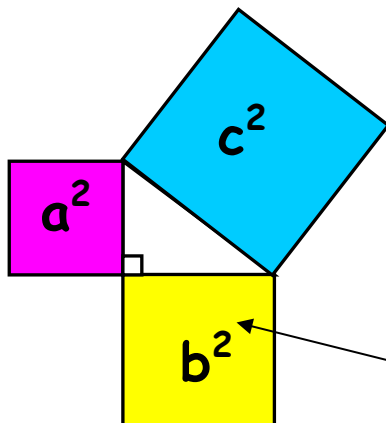
Point F is  $035^\circ$  from D and  $114^\circ$  from E. Mark the position of F.



A bearing is an angle that is measured clockwise from North.

The bearing of X from Y is  $165^\circ$ . What is the bearing of Y from X?

- Can you use Pythagoras' Theorem to find the missing length of a right-angled triangle? 😊 😐 😞

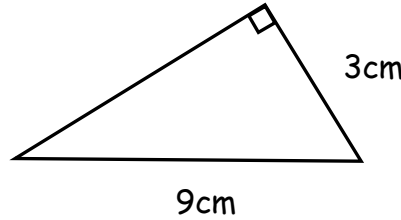
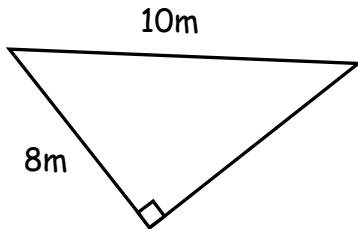
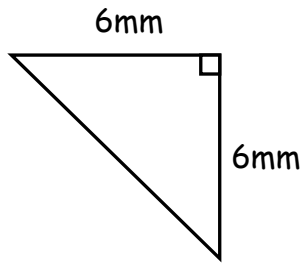
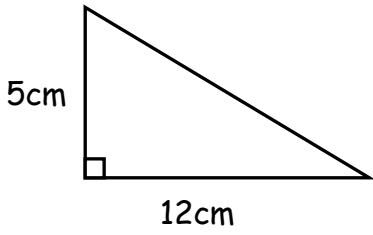


Pythagoras' theorem states that the square of the hypotenuse of a right-angled triangle is equal to the sum of the squares of the other two sides.

$$c^2 = a^2 + b^2$$

The hypotenuse is the longest side, opposite the right angle!

Find the missing side lengths of these right-angled triangles:



Don't forget units!

Remember on a non-calculator question, if you can't find the exact square root, you can leave your answer in surd form (e.g.  $\sqrt{13}$  or  $\sqrt{2}$ )

Solve these word problems, leaving your answers in surd form:

1. What is the diagonal of a square of side 8cm?
2. A wire goes from the top of a vertical pole into the ground at a point 15m from the base of the pole. If the ground is horizontal and the wire is 20m long, how high is the pole?

• Can you use a ruler and compasses to draw constructions?



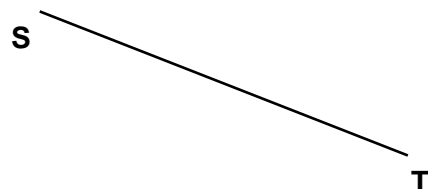
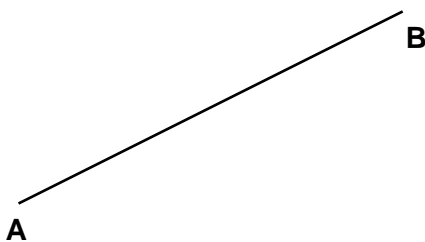
You need the following equipment:

- A sharp pencil
- A ruler
- A pair of compasses

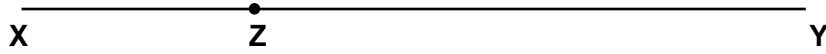
*Perpendicular* means "at right angles"

*Bisector* Means "cut in half"

Construct the perpendicular bisector of these line segments:



You may also be required to construct perpendicular lines through other points.  
 Draw a perpendicular line to line segment XY at point Z:



Draw a perpendicular line to line segment XY through point Z:



- Can you construct a loci of points?



Construct the loci for the following:

A **locus** (plural: **loci**) is a set of points that satisfy a given set of conditions or constraints

4 cm from point A



Less than 4 cm from A and less than 3.5 cm from B

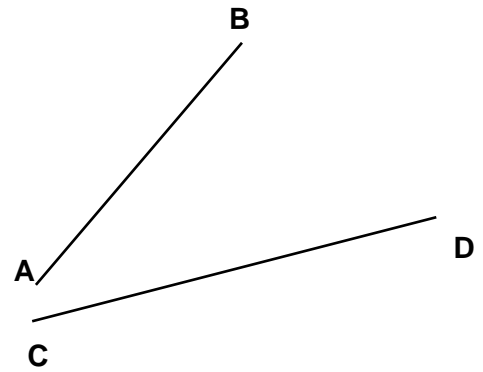


Equidistant between two points



Equidistant between two line segments

Equidistant means "equal distance"



I am looking to buy a house 10 miles from my work and 5 miles from my husband's work. Using a scale of 1cm : 2.5miles, shade the region where I should look for a house.

My work

My husband's work

A zoo is building a new tiger enclosure. Using the scale 1cm : 3m, draw the fence which is exactly 3m from the cage.

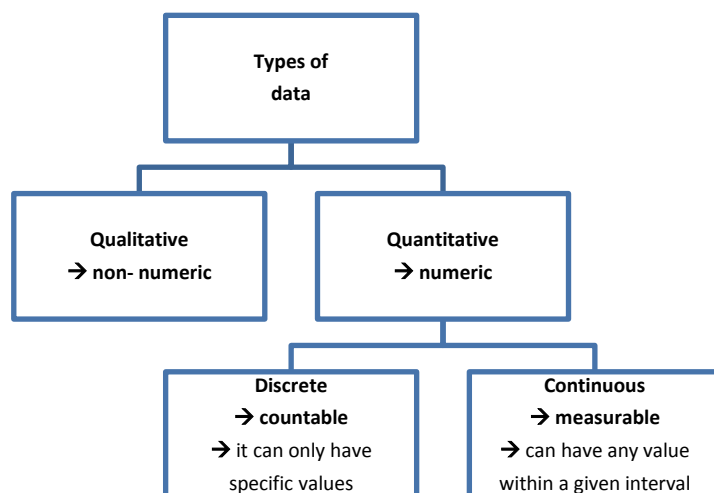




## Data Handling

- Can you write hypotheses about the expected relationship between two variables? 😊 😐 😞

- Do you understand the difference between discrete and continuous data? 😊 😐 😞



- Can you design and use a data collection sheet, appropriate for the type of data to be collected? 😊 😐 😞

- Can you construct, use and interpret scatter graphs? 😊 😐 😞

A scatter graph is used to show if there is a correlation between two data variables.

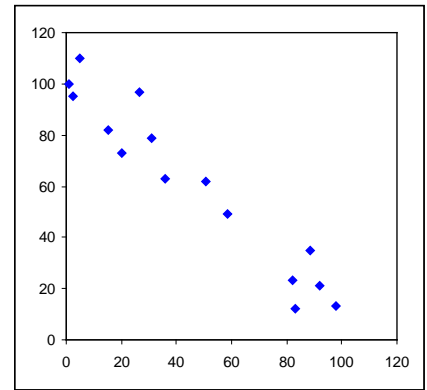
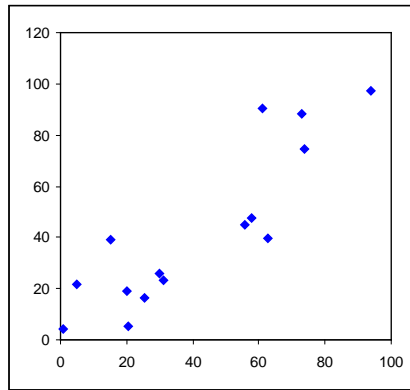
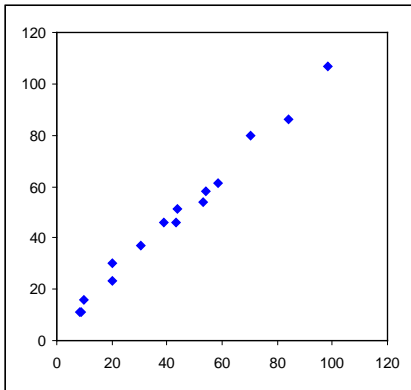
To describe a correlation, use the words: *positive, negative, strong, weak*

If there is a correlation, a line of best fit can be drawn; the line of best fit can be used to estimate data.

Can you use a scatter graph to test the following hypotheses? If so, state what type of correlation you would expect to see.

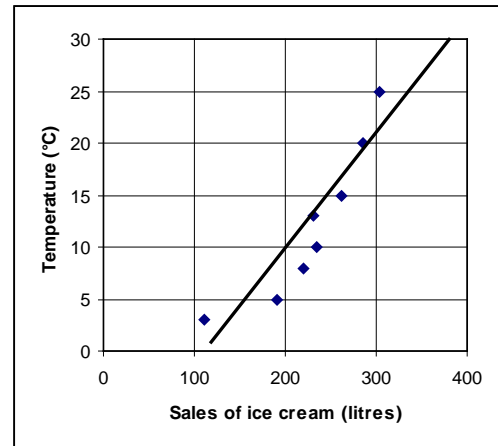
Hypothesis	Scatter Graph?	Type of correlation
"The faster your reaction on the first attempt, the faster your reaction on the fifth attempt of a reaction test."		
"Year 9 pupils have faster reactions than Year 7 pupils."		
"The more sleep you have, the smaller your reaction time."		

Draw a line of best fit on these scatter graphs and comment on the correlation for each graph.

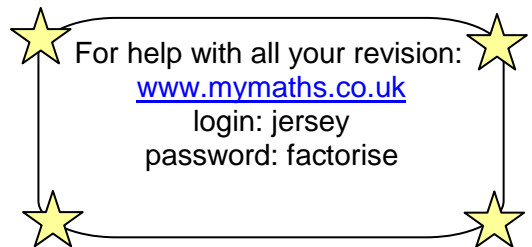


The scatter graph shows temperature and ice cream sales. Estimate:

- (a) The temperature to sell at least 200 litres of ice cream.
- (b) The sales of ice cream if the temperature is 27°C



# D2 - Revision Worksheet



## Number (DNum2)

### 1. Can you round numbers ?



Complete the following table by rounding each number as indicated

	Number	Rounded to 1 dp	Rounded to 2 dp	Rounded to 1 sf	Rounded to 2 sf	Rounded to 3 sf	Rounded to 4 sf
a)	517.3462						
b)	3.05383						
c)	0.0077777						
d)	95.5071						
e)	3789.356						
f)	189,230.58						
g)	99.895						

### 2. Can you truncate numbers ?



Complete the following table by truncating each number as indicated

	Number	Truncated to 1 dp	Truncated to 2 dp	Truncated to 1 sf	Truncated to 2 sf	Truncated to 3 sf	Truncated to 4 sf
a)	517.3462						
b)	3.05383						
c)	0.0077777						
d)	95.5071						
e)	3789.356						
f)	189,230.58						
g)	99.895						

Which values are the same when rounded and truncated? Why is this?

### 3. Can you use your calculator efficiently ?



(In each question, write down the full calculator display )

a)  $\frac{64.4 - 2.67}{8.2 + 9.03^2} =$

b)  $\frac{17.3 + 11.5}{(1.2 + 1.8)^3} =$

c)  $\sqrt[3]{56.14 - 21.14} =$

d)  $1\frac{2}{3} \div 4\frac{5}{6} =$

e)  $\frac{2}{3} \times \left( \frac{7}{13} + \frac{9}{11} \right)^2 =$

f)  $\frac{-7\pi}{\sqrt{6.7^2 - 21}} =$

### 4. Can you use your calculator to solve real life problems ?



(Write down the full calculator display)

- a) In 2012, David drove 8360 miles in his car. His car does 37 miles to the gallon. Petrol cost £1.45 per litre. One gallon is 4.55 litres. Calculate how much in pounds David spend on petrol in 2012. Give your answer to 3sf.
- b) Show how you can use approximation to check that your answer is of the right order of magnitude

### 5. Can you calculate upper and lower bounds of a number and hence the error interval?



- a) Express the upper and lower bounds as inequality error intervals for the following **rounded** values:

*e.g: 5.2 (1dp)  $5.15 \leq x < 5.25$*

a) 30 (nearest 10)      b) 5.6 (2sf)      c) 7.65 (2dp)      d) 8.92 (3sf)

e) 8.00 (2dp)      f) 50.11 (2dp)      g) 2.300 (3dp)      h) 3.141 (4sf)

- b) Express the upper and lower bounds as inequality error intervals for the following **truncated** values:

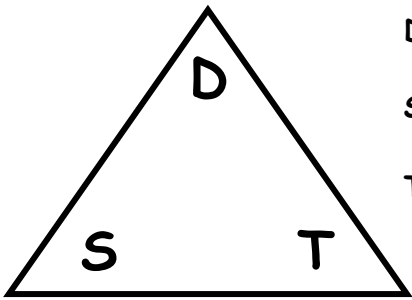
*e.g: 5.2 (1dp)  $5.15 \leq x < 5.25$*

a) 30 (nearest 10)      b) 5.6 (2sf)      c) 7.65 (2dp)      d) 8.92 (3sf)

e) 8.00 (2dp)      f) 50.11 (2dp)      g) 2.300 (3dp)      h) 3.141 (4sf)

## Compound measures

### Speed



$$D = S \times T$$

$$S = D \div T$$

$$T = D \div S$$

### 6. Can you work with compound measures?

An employee is paid £180 for 15 hours of work, what is their hourly rate?

### 7. Can you calculate with speed, distance, time ?



a) How many minutes does it take for a man to run 5200m at a speed of 8km/h ?

b) How far in km does a deer run in 5 mins at 15 metres per second ?

c) What speed in km/h must a race car go to cover 5400m in exactly 2 mins ?

## Algebra (DAIlg2)

### Equations (with fractions and sums of brackets)

#### 1. Can you solve equations with fractions ?



a)  $\frac{3x+2}{4} = \frac{4x+7}{6}$

b)  $\frac{4x-1}{2} = \frac{11x+4}{6}$

c)  $\frac{3x-4}{4} = \frac{2x-1}{3}$

d)  $\frac{3x-15}{4} = \frac{5-x}{7}$

#### 2. Can you solve equations with sums of brackets ?



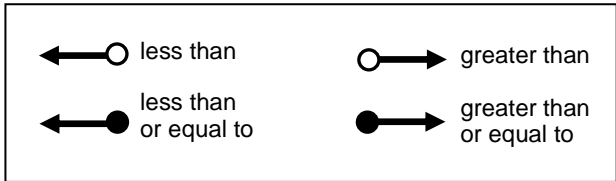
a)  $3(2+4x) + 3(5-x) = 30$

b)  $5(6x+3) - 4(5x+1) = 41$

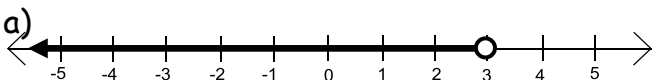
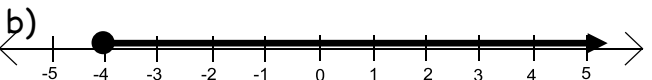
c) $5(4x+1) - 9(2x-3) = 38$	d) $3(4x-2) - 2(5x-7) = 20$
-----------------------------	-----------------------------

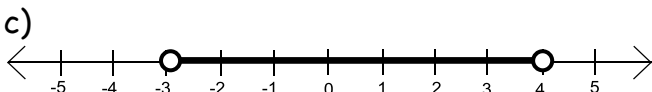
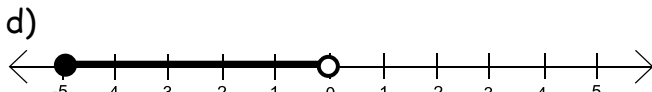
## Inequalities

$x > y$  means  $x$  is greater than  $y$   
 $x \geq y$  means  $x$  is equal to or greater than  $y$   
 $x < y$  means  $x$  is less than  $y$   
 $x \leq y$  means  $x$  is equal to or less than  $y$



**1. Can you write down the inequalities shown on the number lines below ?**

a)  b) 

c)  d) 

**2. Can you represent these inequalities on a number line ?**

a)  $x < -1$       b)  $x \geq 0$

c)  $-2 < x < 2$       d)  $1 \leq x < 2$

**3. Can you list all the values of  $x$  that satisfy these inequalities when  $x$  is an integer ? (Hint: An integer is a whole number !)**

a)  $-3 < x < 2$       b)  $4 < x < 11$

c)  $1 \leq x \leq 6$       d)  $-5 < x \leq 0$

#### 4. Can you solve the following inequalities ?



a)  $5x - 3 \leq 7$

b)  $2x + 1 < -5$

c)  $6x - 6 \leq 36$

d)  $x - 4 \leq 2x + 1$

e)  $10x + 3 \geq x + 12$

f)  $5(2 - 4x) > 2x - 10$

g)  $2 < 5x - 3 \leq 7$

h)  $-8 \leq 3x + 1 < 10$

i)  $3 < 6(x - 5) \leq 36$

#### 5. Can you use inequalities to show regions on a grid ?



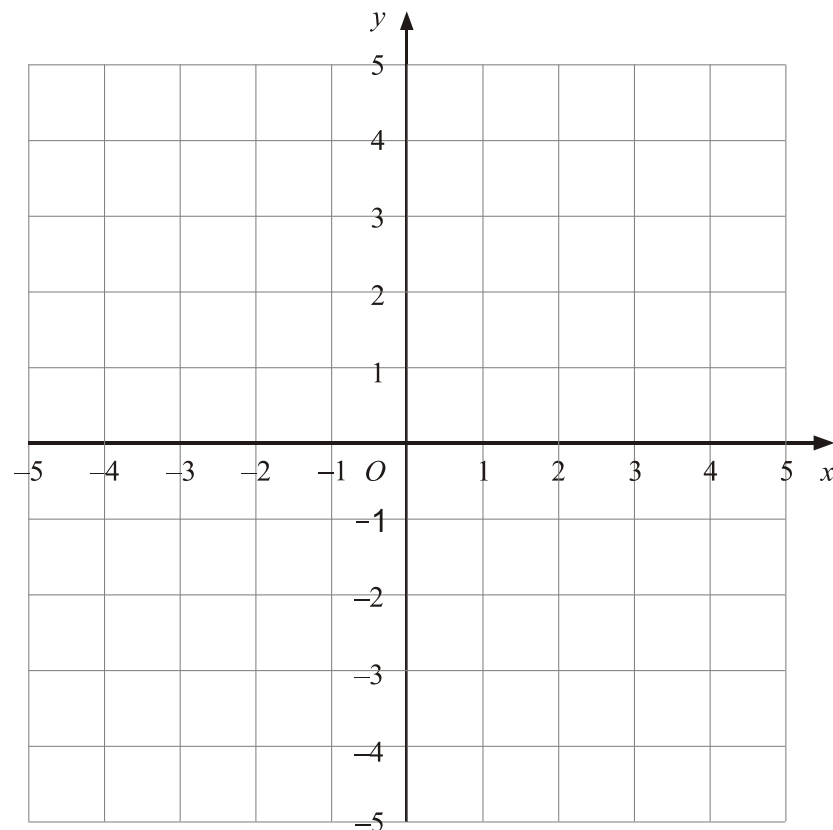
a) On the grid, show by shading, the region which satisfies all three of the inequalities:

$$x \leq 1$$

$$y > -2$$

$$y < 3x - 2$$

Label the region R



b) Mark with an 'X' any points within Region R that have integer coordinates. Write down the coordinates of any points found.

**Note:**

$<$  or  $>$  = a dotted line because the points on the line are NOT included

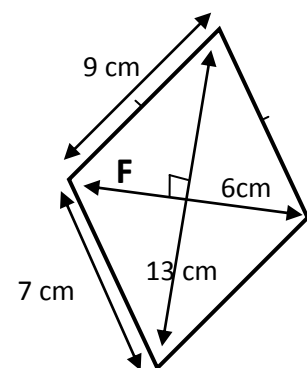
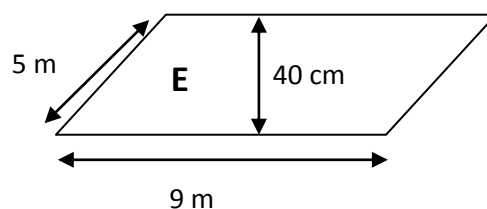
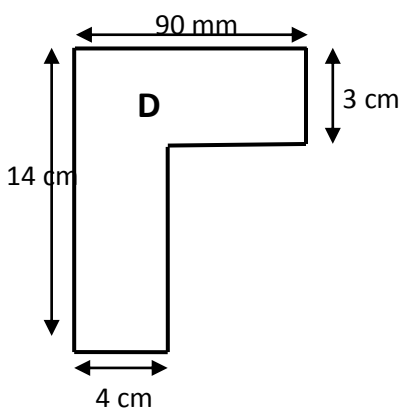
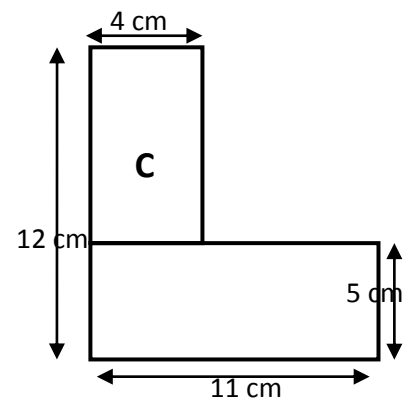
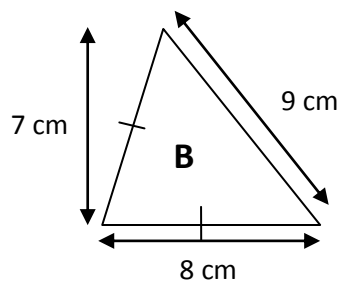
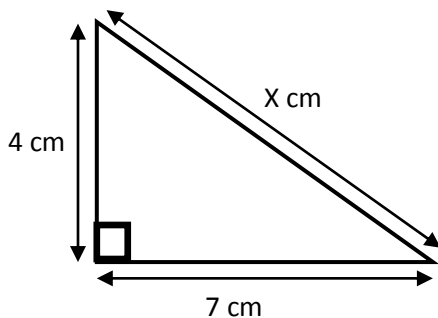
$\leq$  or  $\geq$  = a solid line because the points on the line ARE included

## 6. Can you form and solve inequalities from word problems? ☺ ☹ ☹

A student with a distrust of banks keeps money under his mattress and at the end of every month he deposits a £20 note there. He remembers that he initially stashed £120 under the mattress which he obtained by closing a savings account that his parents set up for him, but he can't remember when he did this. At the end of a particular month (after depositing his £20 note), he does a quick survey of how much money he has under the mattress and finds that it is at least £200. What can be said about the number of months passed since he closed the savings account?

## Geometry (DGeom2)

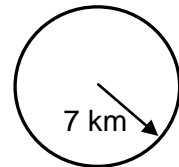
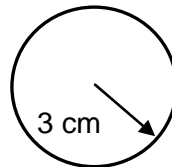
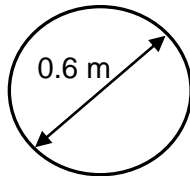
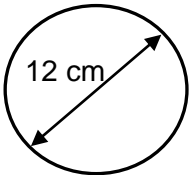
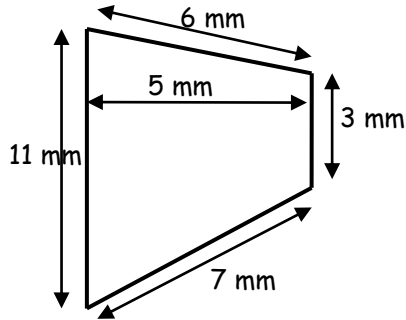
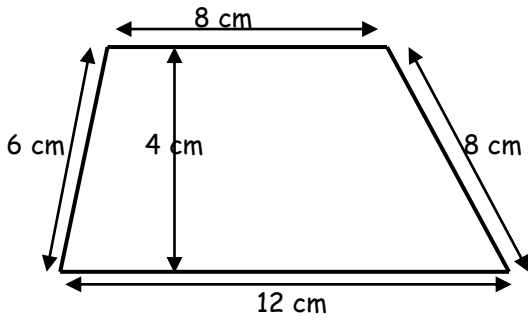
### 1. Can you calculate the area and perimeter of these shapes? ☺ ☹ ☹





1. Can you calculate the area and perimeter of these shapes ? ☺ ☹ ☹

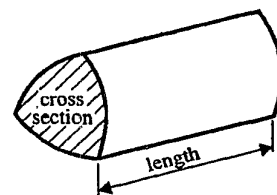
For the circles give your answer in exact form and rounded to 3sf.



**Prisms**

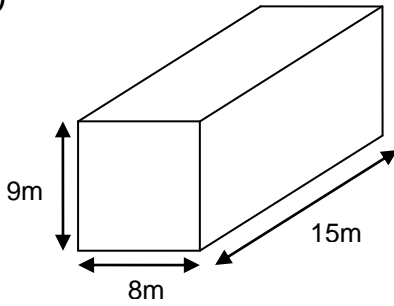
Volume = area of cross section  $\times$  length

Surface Area = area of it's net  
 = (2  $\times$  area of cross section) + (perimeter of cross section  $\times$  length)



**2. Can you calculate the volume and surface area of these prisms ?**

a)

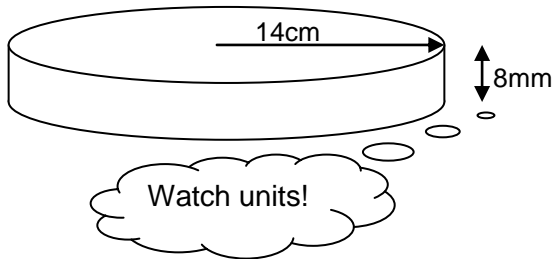


Volume =



Surface Area =

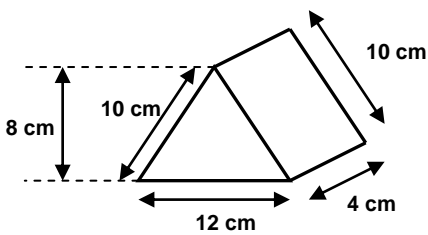
b)



Volume =

Surface Area =

c)



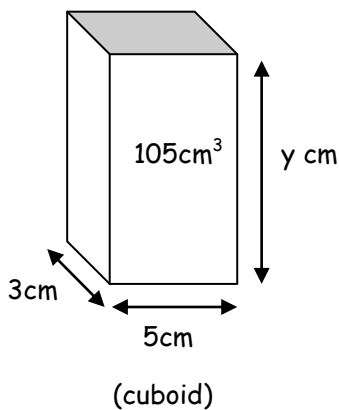
Volume =

Surface Area =

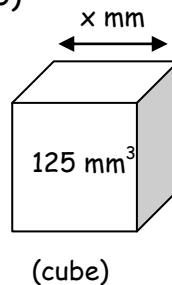
**3. Can you find the missing side of a prism given its volume ?**



a)



b)



# Data (DData2)

## Averages and spread:

- MODE - Value or group which has the highest frequency; sometimes known as the *modal class*
- MEDIAN - Organise the data from smallest to largest then find the middle value; with grouped data you may only be able to state the group which contains the median.
- MEAN - Add up all the values and divide by the number of values; to find the *estimated* mean from grouped data, find the midpoint of each group and multiply it by the group's frequency. Find the total of the midpoint x frequency calculations and then divide by the total frequency.
- RANGE - Largest value take away the smallest value - the range tells you the spread of the data.

### 1. Can you find the averages and range from a frequency table ? 😊 😐 😞

Jack asks his friends how many televisions they have in their house and puts the results into a frequency table.

Number of televisions	Frequency	
0	3	
1	5	
2	15	
3	9	
4	4	

- How many pupils took part in Jack's survey ?
- What is the modal number of televisions ?
- What is the mean number of TVs ? (Hint: use the extra column in the table)
- What is the median number of televisions ?

### 2. Can you find the mean, mode and median from grouped data ? 😊 😐 😞

100 Year 11 pupils collected their reaction times.

Below are their results with no distractions:



Reaction time (sec)	Frequency		
$0 < \text{time} \leq 0.1$	9		
$0.1 < \text{time} \leq 0.2$	19		
$0.2 < \text{time} \leq 0.3$	46		
$0.3 < \text{time} \leq 0.4$	15		
$0.4 < \text{time} \leq 0.7$	11		

- Calculate the estimated mean (Hint: use the spare columns in the frequency table)
- Explain why this is only an estimate of the mean
- Find the modal class.
- Find the group which contains the median.

Good Luck !

# D ND3 Revision Worksheet

For help with all your revision:

[www.mymaths.co.uk](http://www.mymaths.co.uk)

login: jersey

password: factorise

## Number (DNum3)

### 1. Can you create equivalent fractions ?



#### Can you convert between mixed numbers and improper fractions ?

You can make equivalent fractions by multiplying or dividing the numerator and the denominator by the same number

Eg:

$$\frac{3}{4} = \frac{30}{40}$$

X 10 (top arrow) and X 10 (bottom arrow)

OR

$$\frac{5}{20} = \frac{1}{4}$$

÷ 5 (top arrow) and ÷ 5 (bottom arrow)

The **numerator** is the top number of the fraction  
The **denominator** is the bottom number of the fraction !

Change improper fractions to mixed numbers and vice versa.

Example:

$$2\frac{1}{15} = \frac{15}{15} + \frac{15}{15} + \frac{1}{15} = \frac{31}{15}$$

Example:

$$\frac{31}{15} = \frac{15}{15} + \frac{15}{15} + \frac{1}{15} = 2\frac{1}{15}$$

A **mixed number** has a whole number and a fraction

An **improper fraction** (also known as a **top-heavy fraction**) has a larger **numerator** than **denominator**

### 2. Can you work out a fraction of an amount ?



Calculate:

a)  $\frac{1}{4}$  of 36

b)  $\frac{1}{10}$  of 79

c)  $\frac{3}{4}$  of 32

d)  $\frac{5}{6}$  of 66

e)  $\frac{5}{7}$  of 56

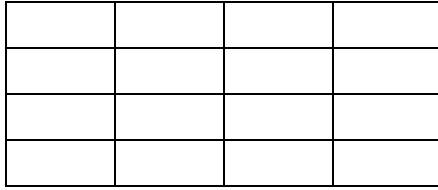
f)  $2\frac{1}{4}$  of 30

### 3. Can you multiply a fraction by a fraction ?

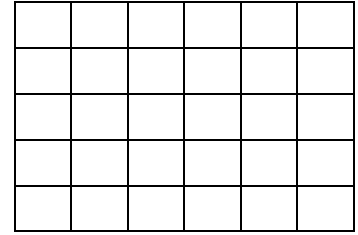


Use the diagrams provided, or otherwise, to calculate:

a)  $\frac{1}{4} \times \frac{3}{4}$



b)  $\frac{5}{6} \times \frac{3}{5}$



Calculate, leaving your answer in its simplest form:

c) $\frac{1}{4} \times \frac{8}{9}$	d) $\frac{3}{10} \times \frac{20}{27}$	e) $\frac{3}{4} \times \frac{8}{9}$
f) $\frac{5}{6} \times \frac{66}{70}$	g) $2\frac{1}{4} \times \frac{28}{30}$	h) $3\frac{1}{2} \times \frac{8}{14}$

Change mixed numbers into improper fractions first

### 4. Can you find the reciprocal of a number ?

The product of a number and its reciprocal is always 1.

Eg: The reciprocal of 2 is  $\frac{1}{2}$  because  $2 \times \frac{1}{2} = 1$

Write down the reciprocals of:

a) 3 = .....
b) 6 = .....
c) 18 = .....
d) -10 = .....
e) $\frac{1}{4}$ = .....
f) $\frac{3}{4}$ = .....
g) $\frac{5}{8}$ = .....

Hint:  
Write your number as a fraction, then flip the fraction over to find the reciprocal. For example:  
Qu: Find the reciprocal of 5  
Ans: Write 5 as a fraction to get 5/1  
Flip the fraction over to get 1/5  
1/5 is the reciprocal of 5  
Qu: Find the reciprocal of  $2\frac{3}{8}$   
Ans: Write  $2\frac{3}{8}$  as a top heavy fraction to get 19/8. Flip the fraction over to get 8/19  
8/19 is the reciprocal of  $2\frac{3}{8}$

h) $1\frac{1}{4}$ = .....
i) $2\frac{5}{8}$ = .....
j) $4\frac{2}{3}$ = .....

## 5. Can you divide fractions ?

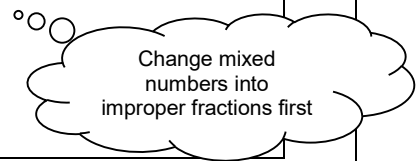


"Dividing by a fraction is the same as multiplying by the fraction's reciprocal"

Eg:  $\frac{2}{5} \div \frac{5}{9} \longrightarrow \frac{2}{5} \times \frac{9}{5} = \frac{2 \times 9}{5 \times 5} = \frac{18}{25}$

Calculate the following:

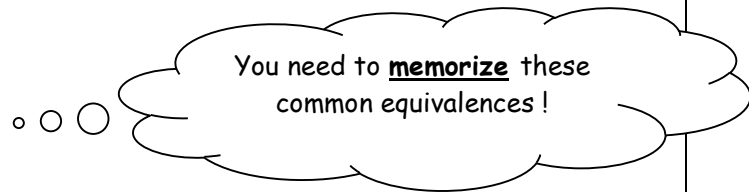
a) $\frac{1}{4} \div \frac{7}{8}$	b) $\frac{1}{10} \div \frac{3}{4}$	c) $\frac{3}{4} \div \frac{27}{36}$
d) $\frac{5}{6} \div \frac{15}{18}$	e) $\frac{12}{13} \div \frac{8}{39}$	f) $1\frac{3}{4} \div \frac{28}{32}$



## 6. Can you convert between per cent, decimals and fractions ?



Fraction	Decimal	Percentage
1	1	100%
$\frac{1}{2}$	0.5	50%
$\frac{1}{4}$	0.25	25%
$\frac{3}{4}$	0.75	75%
$\frac{1}{8}$	0.125	12.5%
$\frac{3}{8}$	0.375	37.5%
$\frac{5}{8}$	0.625	62.5%
$\frac{1}{3}$	0. $\dot{3}$	33. $\dot{3}$ %
$\frac{2}{3}$	0. $\dot{6}$	66. $\dot{6}$ %
$\frac{1}{10}$	0.1	10%
$\frac{1}{20}$	0.05	5%
$\frac{1}{25}$	0.04	4%
$\frac{1}{100}$	0.01	1%



a) Complete the following table (simplify fractions where possible):

Fraction	Decimal	Percentage
$\frac{3}{5}$		
	0.15	
		80%
$\frac{7}{8}$		
	0.65	
		32%
	0.03	
$\frac{5}{4}$		

**6. Can you calculate percentages of amounts ?**



**Can you calculate a percentage increase or decrease ?**

**Can you express one amount as a percentage of another ?**

a) 30% of 78	d) Increase 52 by 20%	g) £18 as a percentage of £90
b) 16% of 190	e) Increase 36 by 12%	h) 42cm as a percentage of 8.4m
c) 17.5% of 220	f) Decrease £12.50 by 15%	i) 30mm as a percentage of 2m

**7. Can you find the original amount when told the new amount and the percentage increase/decrease ?**



a) A dress is priced at £40 after a 20% reduction in price. What was it's original amount ?

b) Your salary is increased by 15% to £17,250. What was your salary before the increase ?

## 2. Can you calculate simple and compound interest ?



a) Mary earns 5% simple interest per year on the £2000 she has in Trustbank. Grace receives 5% compound interest per year on the £2000 she has in Growbank. If both of them leave their savings untouched, calculate the difference between their savings at the end of two years.

Mary:..... Grace:..... Difference:.....

## 3. Can you calculate repeated percentage changes using the power key on your calculator ?



$$\text{Final amount} = \text{Starting amount} \times \text{Rate}^{(\text{time periods})}$$

Eg 1: Find the value after 4 years of an investment of £4000 at a compound interest rate of 6%.

$$\begin{aligned} \text{New amount} &= 4000 \times 1.06^4 \\ &= 4000 \times 1.2624... \\ &= \text{£}5049.91 \end{aligned}$$

Eg 2: Find the value after 6 years of an £8000 car depreciating at a rate of 5% per year.

$$\begin{aligned} \text{New amount} &= 8000 \times 0.95^6 \\ &= 8000 \times 0.7350... \\ &= \text{£}5880.74 \end{aligned}$$

The single number the starting amount can be multiplied by to get the answer

a) An estate agent tells George that the houses in his area are likely to increase in value by 7% per year for the next 10 years. If George's house is worth £250,000 now, how much is it likely be worth in 10 years ?

Answer.....

b) A population of bats is forecast to decrease by 2% every year. There are currently 500 bats in the population, how many will there be in 8 years time ?

Answer.....



# Data (DData3)



## 1. Can you use probabilities to estimate the number of times an outcome will occur? 😊 😐 😞

a) In Britain, the probability of a 17 year old passing the driving test first time is 0.6. Tomorrow, two hundred 17 year olds will be sitting the test for the first time. How many would you expect to pass ?

b) Alice has a biased dice. She rolls it 100 times and gets a six 38 times. If she rolls it 750 times, how many times would you expect her to get a six ?

## 2. Can you estimate probabilities (find the relative frequency) from experimental data? 😊 😐 😞

David has a box of shapes. He selects a shape at random, records the shape and then replaces it. He repeats this 60 times. Here are his results:

Shape	Triangle	Square	Pentagon
Frequency	12	32	16

a) Calculate  $P(\text{square})$

b) There are 20 shapes in the box. How many are triangles?

## 3. Can you compare theoretical probability and relative frequency? 😊 😐 😞

Ben and Clare are playing a dice game. They roll two six-sided dice. If the difference between the scores is 0, 1, or 2 then Ben wins. If the difference is 3, 4, or 5 then Clare wins.

a) Calculate the theoretical probability of Ben winning. Use a two way table to help you.

Ben and Clare play the game 100 times. Here are the results:

Ben wins	72
Clare wins	28

b) Calculate the relative frequency of Ben winning.

c) Were the dice fair ? How could you make sure ?

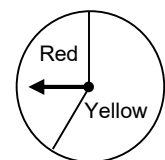
## 4. Do you know that repeating experiments may lead to differing results but that more trials would give better estimates of probability? 😊 😐 😞

A spinner has a red sector and a yellow sector. The arrow is spun 1000 times. The table shows the estimated probability of a red after different numbers of spins.

Number of spins	Estimated probability
50	0.42
100	0.36
200	0.34
500	0.3
1000	0.32

a) How many times was a red obtained after 200 spins?

b) Which estimated probability would be best to use ? Explain your answer.



Look again at the maths you have done previously - there will be some revision questions on the test. Good Luck !